

AN ARTIFICIAL TABLE OF THE SPECIES OF
HADENA, ETC., OF EASTERN NORTH
AMERICA, NORTH OF THE
CAROLINAS.

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The species included in this table are those usually put in *Hadena*, with the genera *Helotropha*, *Trachea*, etc., which are not readily separable from it. Some have been placed in *Eustrotia*, *Chytonix*, *Trachea*, *Dipterygia*, *Hadenella*, *Orthosia*, *Dryobota* and *Macronoctua*, as well as the genera *Luperina*, *Xylophasia*, *Parastichtis* (of Hamp., but not of Sm.), *Eumichtis*, *Oligia* (Hamp., but not Sm.), etc., which are usually considered subgenera of *Hadena*; but all are closely related to the *Hadenas* as commonly understood, or else commonly placed among them.

The group may be defined as normally trifold Noctuidæ,—with vein M_2 (5 of the German system) a little stronger in some specimens of *palliatricula*, etc., causing them to be sought among the Intermediids. The vestiture is usually mixed, never of simple hair and untufted, but often overlaid with rough hair, especially in the arctic species, and never of simple scales, but with the scales only a little lengthened in *hausta* and *exhausta*. The eyes are naked, and may be lightly, but never strongly, lashed. The thorax usually has a slight median crest in the more hairy forms, but the crest is never prominent and its distinctness depends on the position of the patagiæ and tegulæ. More often the thorax is roughly clothed with more or less divided crests, the appearance again depending largely on the position of the patagiæ and tegulæ, and the condition of the specimen. The antennæ are variable, pectinate in male *illocata*, rarely serrate, ciliate or fasciculate in the majority of forms, but simple and deeply prismatic in a few of the species related to *miselioides*. In the female they are always simple, so that this character is often useless for identification. The palpi are upturned but often with the third joint porrect, rarely reaching the vertex, the second joint mostly rough-scaled below. The tongue is developed, the eyes large except in *includens*, the front

smooth and somewhat rounded out, most so in *palliatricula*, *viridimusca*, etc., where it is also very narrow. The legs are unarmed, with hairy tibiæ, but without massive tufts on the tibiæ; the abdomen at least with a slight basal tuft, usually with several tufts, of which the third and fourth are normally largest. A single tuft is not conspicuously enlarged, and the basal one is not a fanlike mass of scales.

The group intergrades with the *Acronyctinæ* on the one hand and with *Eustrotia* on the other. From *Acronycta*, *Bryophila*, etc., in the last resort there seems to be no reliable separating character. In all the species I have examined of *Acronycta*, *Arsilonche*, *Microcælia*, *Leuconycta*, *Bryophila* (*Bryocodia*) and *Polygrammate* the maxillary palpi are a little larger than in the *Hadenas* examined, projecting distinctly beyond the tip of the pilifer when the labial palpus is removed. However, the maxillary palpus is of the same character, terminated with a tuft of scales, in both, and the difference may be partly only apparent. If I am not mistaken this separation will associate *Leuconycta* (*diphtheroides*) and *Bryophila* (*lepidula* and *teratophora*) with *Acronycta*, separating them from *Chytonix* and *Amyna orbica*, which have the small maxillary palpi. It will be interesting to see whether the caterpillars, when discovered, agree with this.

As to the related genera, *Crambodes*, *Oligia* (*Monodes*), *Balsa*, etc., are separated by the combination of nearly scaly vestiture and lack of tufting.

From *Eustrotia* (*Erastria*) the slenderest *Hadenas* differ only in the normal trifold venation, those species in which the venation is unstable, seeming to be always over an inch in expanse, and with vestiture at least of spatulate scales if not deeper.

In *Amolita*, *Senta*, etc., the tongue is weak.

Caradrina is slenderer and smaller than the *Luperinas*, being one to one and one half inches in expanse, and differs from the slender *Hadenas* in the untufted abdomen.

Perigea and *Amphipyra* have very glossy vestiture, palpi upturned to vertex and except in the *xanthioides* group closely scaled,—besides, in *Amphipyra* the abdomen is strongly flattened.

Polia combines a strong hair-tuft on basal joint of antennæ simulating lashes, or true lashes in front of the antennæ, with a nearly untufted abdomen.

In *Hyppa* the thorax is strongly flattened dorsally, without decided tufts, but with feathery vestiture.

In *Parastichtis* (*Tæniosca*) the palpi are upturned to the vertex, body slender, and eyes slightly lashed.

In *Euplexia* there is a single much enlarged tuft on the third segment of the abdomen, and the vestiture of the patagiæ is evenly cut off, not loose and hairy, at the edge.

Delta (*Actinotia* of American authors, but not of Europe) has massive tufts of hair on the tibiæ.

Prodenia and *Laphygma* have triangular translucent hind wings, with narrow dark veins and border. The thorax is not distinctly tufted in front, but has a strong spreading or divided tuft behind. In *Prodenia* there are several abdominal tufts, and in *Laphygma* but one.

Magusa has very large triangular hind wings and very narrow fore wings.

Homohadena has imbricate, apparently scaly vestiture as a rule, sometimes overlaid with hair; the eyes are distinctly lashed and the frontal vestiture is short and fine, unlike that of any other lashed-eyed forms.

Ommatostola and *Cosmia* (*Enargia*) have no tufts whatever and perfectly hairy vestiture, in *Calymnia* the vestiture is a little coarser.

In *Apamea*, *Ipimorpha* and *Atethmia* the apex is acute, subfalcate, and the outer margin perfectly even. The latter character distinguishes *Consercula* also.

Fagitana completely lacks M_2 of the hind wing.

Agrotiphila and *Anchocelis* have small eyes.

In *Lithomia*, *Xylina* and *Litholomia* the frontal tuft above is very large, divided both longitudinally and transversely, and the eyes are strongly lashed.

Cucullia and in a less degree *Catabena* have much enlarged hood-like tegulæ, capable of being turned forward over the head.

Pyrrhia, *Xanthia*, etc., are distinguished by the very prominent anterior thoracic tuft or central ridge, *Amathes* by its heavily lashed eyes, and most of the other *Orthosiids* by the strongly flattened abdomen.

In *Brotolomia* the outer margin of the fore wing is strongly irregular, and in *Anomis* there is a small raised white orbicular tuft besides.

In *Trigonophora* the vestiture of the patagiæ is evenly sheared off, as in *Euplexia*.

Tapinostola has stumpy oblong wings combined with slight tufting. It seems to be confined to marshes.

The remaining *Noctuidæ* not considered here differ in strong and definite structural characters, mostly in the venation, armature of tibiæ, presence of hair on the eyes, or frontal modification. *Hillia* is not considered from lack of material but should be included, as it combines the structures of *Dryobota* with those of the *ducta* group.

1. All the veins contrasting, white *Luperina niveivenosa*.
1. Veins largely white on outer part of wing.... *Helotrophæ (Eustrotia) retis*.
1. With tip of stem of *Cu*, and base of *Cu*₁ and *M*₃ white, the other veins inconspicuous 2.
1. Without contrasting white veins 4.
2. Abdomen smooth *Luperina stipata*.
2. Abdomen tufted dorsally 3.
3. Expanse about two inches, body heavy and vestiture deep.

Helotrophæ reniformis.

3. Expanse much less, body rather slender and vestiture almost scaly.
- Helotrophæ (Eustrotia) caduca*¹
4. Marked more or less with green 5.
4. Without any decided green markings 7.
5. Contrasting white t.a. and t.p. lines..... *Chytonix (Hadena) viridimusca*,
Chytonix (Hadena) chlorostigma.²
5. A large white reniform *Hadena miselioides*.
5. White marks inconspicuous 6.
6. Largely purple, an oblique pale shade along *M*₃ and *Cu*₁, with a triangular dark claviform below *Trachea delicata*.
6. Ground color green, evenly marked with blackish *Hadena miselioides*.
7. Dull black with velvety black markings.... *Xylophasía (Trachea) impulsæ*.
7. Paler or with considerable pale markings 8.
8. Hind wing yellow with strong blackish veins, outer shade and post-medial line *Xylophasía (Trachea) inordinata*.
8. Hind wing not bright-colored 9.
9. Subterminal space finely striate on and between the veins.

Dipterygia (Hadena) patina.

¹ *Caduca* is typically red-brown, blackish specimens of this appearance would perhaps be better placed in *H. retis*.

² These two names may represent but a single species. *H. chlorostigma* is described as smaller, expanding rather under 1 inch, with the green confined mostly to the centers of orbicular and reniform spots, and with a small black claviform. *H. viridimusca* is larger, with rather more green and larger dark-outlined claviform. Both belong to *Chytonix*.

9. Subterminal space at most with fine lines on the veins and black wedges or arrow-heads between10.
 10. Median area above dash in submedian fold, contrasting, white.

Chytonix palliatricula.

10. Median area not white and contrasting11.
 11. A white spot in submedian fold before the t.p. line, connected by a black bar to t.a. line12.
 11. No contrasting white dot before t.p. line in submedian space13.
 12. Larger; t.p. line meeting inner margin at right angles...*Chytonix sensilis*.
 12. Smaller; t.p. line oblique below*Chytonix palliatricula* var. *taspis*.
 13. Fore wing with almost even red-brown ground color, the margin darker.14.
 13. Ground color of medial area red, of subterminal area contrastingly paler gray15.
 13. Ground color not decidedly red16.
 14. Upper part of outer edge of fore wing transverse, reniform with white outline and central spot*Xylophasia (Agroperina) cogitata*.
 14. Outer margin more oblique, reniform with outer white lunule only.

Xylophasia (Agroperina) lateritia.

15. Medial area rose and orange, subterminal space pale blue-gray; small with straight costa*Hadena (Oligia) bridghami*.
 15. Medial area deep red and black, st. space with a greenish cast, expanse two inches*Xylophasia (Parastichtis) arctica*.
 15. Ground color crimson, small with strongly arched costa.

Hadenella (Oligia) minuscula.

16. T.a. and t.p. lines closely approaching or joined near inner margin enclosing a brown triangular median area "*Helotropha*" *obtusata*.
 16. T.a. and t.p. lines not enclosing a brown triangle17.
 17. Eyes small, reniform formed of a semielliptical pale outer spot closely enclosed in a pale crescent "*Erastris*" *inclusens*.
 17. Eyes moderate or large, reniform when contrastingly pale, composed of a white central lunule, finely dark-edged and enclosed in a pale spot.18.
 18. Pale gray with a very strong black dash at tip of submedian fold; very small*Hadena (Oligia) exhausta*.
 18. Without a decided dash in submedian fold at margin, or with brown ground color19.
 19. Hind wing mostly pure white, contrasting*Luperina burgessi*.
 19. Hind wing wholly shaded with fuscous, though often quite pale at base.20.
 20. Brown, with a black dash at tip of submedian space and a smaller one before st. line between R_4 and R_5 *Hadena (Trachea) turbulenta*.
 20. Otherwise marked, rarely with any distinct dash at hind angle21.
 21. With a short blackish filled subreniform spot before t.p. line in submedian fold, connected to costa by a concave triangular dark patch; claviform also short and dark-filled*Hadena (Trachea) modica*.
 21. Subreniform not distinct22.

22. Basal half of fore wing dark, outer half pale and contrasting; t.p. straight and black below cell forming the boundary; expanse $1\frac{1}{4}$ ".
Hadena (Oligia) diversicolor.
22. With a quadrate dark patch on middle of inner margin, bounded by *Cu* and the nearly straight and parallel t.a. and t.p. lines; expanse under 1"*Hadena (Oligia) hausta.*
22. Wings rarely divided into a dark basal and light outer half, if so with normally sinuous t.p. line23.
23. Blackish, evenly, with contrasting light brown margins, except before tip of costa*Luperina trigona.*
23. Not blackish and even with contrasting pale margins24.
24. Subterminal with a long W-mark on veins *M*₃ and *Cu*₁, or with these veins black and accompanied by pale streaks to margin25.
24. Subterminal line without a W-mark on *M*₃ and *Cu*₁, at most with teeth of about 60°29.
25. With a heavy basal dash and a heavier patch in middle of submedian fold, without a distinct t.a. line or claviform between them26.
25. Claviform and double t.a. line distinct between the two dashes when both are heavy27.
26. Ground color mainly dark red-brown....*Xylophasia (Parastichtis) nigrior.*
26. Ground color more tawny in middle, clay-colored toward costa and grayish toward inner margin*Xylophasia (Parastichtis) verbascoides.*
27. Thoracic crest high and broadly divided; with a dark bar toward upper edge of patagiæ; ground color brownish28.
27. Thoracic crest high and strongly divided; ground color even dull fuscous, the dashes at basal angle, basal dash and in middle of submedian fold all fine*Parastichtis dionea.*
27. Thoracic crest, not high, and often not distinctly divided; ground color bright tawny brown, without strong dark bands on thorax.
Xylophasia (Parastichtis) lignicolor.
28. Scales beside veins paler than ground color, at least in subterminal space along *M*₃ and *Cu*₁*Xylophasia (Parastichtis) cariota.*
28. Ground color not paler along the veins....*Xylophasia (Parastichtis) vulgaris.*
29. Bright ochre with blackish markings*Orthosia (Agroperina) helva.*
29. Bright ochre with dull red markings, and sometimes with white reniform.
Perigea xanthioides.
29. Not bright orange-ochre (*egens* is rather bright, but smoothly marked and without blackish)30.
30. Collar and patagiæ black, and disc of thorax dark brown, usually contrasting with the paler wings*Xylophasia (Parastichtis) vultuosa.*
30. Thorax not contrastingly dark, or with the center darkest31.
31. T.a. and t.p. lines connected by a heavy black bar in submedian fold....32.
31. T.a. and t.p. lines not connected, or with the bar lost in the blackish ground color34.
32. Light reddish gray and red-brown, the median area below the dash con-

- trastingly pale, outer margin containing more or less distinct blackish patches 33.
32. Gray without red tint *Hadena mactata*, *lona* and *jocasta*.
32. Ash-gray shaded with red-brown, the bar very heavy and outer margin pale *Hadenella* (*Oligia*) *minuscula*.
32. Dark blackish brown *Xylophasia* (*Eumichtis*) *ducta*.
33. T.p. line much curved and oblique outward across submedian space, marked with pure white (as is the reniform) and subterminal space beyond, pale clay-color; male with pectinate antennæ.
- Dryobota* (*Trachea*) *illocata*.
33. T.p. line oblique inwards, less curved in submedian space, the white all replaced by light clay-color, subterminal space shaded and dusted with light red; male antennæ simple. *Trachea indocilis* (*Xylophasia remissa*).
34. Black and white powdered *Hadena* (*Eremobia*) *claudens*.
34. Not clear black and white 35.
35. Black basal dash the most contrasting mark. *Xylophasia* (*Trachea*) *finitima*.
35. Basal dash (above anal vein) inconspicuous if present 36.
36. Dull yellow with paler subterminal space and no dark markings.
- Hadena* (*Oligia*) *egens*.
36. Even dull yellow, powdered with red-brown, usually with dark reniform and powdery marginal shade *Agroperina* (*Orthosia*) *inficita*.
36. Dull yellow, reddish in medial area, with single dark t.a. and t.p. lines.
- Xylophasia* (*Trichoplexia*) *exornata*.
36. Pale powdery luteous with red tint, dusted with brown toward margin.
- Orthosia* (*Agroperina*) *lutosa*.
36. Light luteous-, or reddish brown, shading to powdery gray at inner margin, third joint of palpi long 37.
36. Dull yellow, marked extensively with brown, with two blackish patches on margin 38.
36. Wood brown, with contrasting blackish costa, extended in to fill cell and outer margin *Macronoctua onusta*.
36. Red-brown, mottled and marked with luteous, all diffusely.
- Eremobia maillardi* (*Hadena exilis*).
36. Usually darker and not dull yellow or reddish.¹ 39
37. Middle of wing decidedly paler and yellower, contrasting with the reddish costa *Xylophasia* (*Parastichtis*) *rorulenta*.
37. Wing almost evenly colored *Xylophasia* (*Parastichtis*) *suffusa*.
38. A contrasting blackish patch on costa, extending between orb. and ren.
- Xylophasia* (*Parastichtis*) *vultuosa*.
38. No such contrasting patch *Xylophasia* (*Parastichtis*) *apamiformis*.
39. Abdomen without decided tufts, vestiture very fine, thoracic tufts slight.
- Luperina passer* and *birnata*.
39. Abdomen with a strong basal and sometimes a second weaker tuft.
- Xylophasia* (*Sidemia*) *devastatrix*.

¹ *Passer* is occasionally dull reddish, but nearly evenly, without a suggestion of the powdery mottling of *maillardi*.

